

## The Role of Environmental Knowledge in Altai Peoples' Adaptation to the Conditions of Ecological

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### ABSTRACT

The article is devoted to the experience of traditional nature conservation when it needs to adapt social and natural systems to global climate change. The study provides a brief overview of the regulatory and legal aspects of decision issues concerning land management in Altai region in the context of the problems involved. We also studied problems of adaptation of local people to conditions of current ecological crisis by using modern technologies, such as RES (renewable energy sources). We conclude that state regulation of the processes of adaptation of local population to climate change is now urgently required.

### KEYWORDS

Climate change, indigenous peoples, environmental culture, mountain regions, renewable energy

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## Introduction

We feel there is a need for a more precise and specific definition of the “ecological culture of traditional societies” concept. First, it is worth noting that the research of environmental traditions (ecological culture of traditional societies) has only recently begun. (Beket, Shishin & Engoyan, 2015; Hanna, Langdon & Vanclay, 2016; Nygaard, 2016; Prussing & Newbury, 2016; Røpke, 2016). An analysis of the cited research reports shows that the invaluable experience of the peoples is literally scattered between different sciences. It is studied by ethnographers, culture experts, sociologists, of late also by economists and environmentalists. The described experience often contributes to fundamental knowledge, but unfortunately is not implemented at an adequate level in practice. Nevertheless, taking into account considerable assimilation processes and the reduction of ethno- cultural diversity in the latest centuries in

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different regions of the globe, the existing research still represents a valuable contribution to humanitarian sciences.

## Literature Review

The Altai Mountains territory as a particularly vulnerable area given its climatic and topographic characteristics. Communities living in areas like this experience the simultaneous economic, social and environmental crisis peaks most dramatically. The historical experience of the Altaians, indigenous peoples of the Turkic language group, in traditional nature management, has been preserved to this day. This is a reason why this territory is an interesting subject of careful consideration in a research study. Given the outlined background, it is possible to formulate a number of issues, which, on the one hand, outline the studied problems and, on the other hand, give a logical framework to our research, and, finally, demonstrate a number of crucial points in the indigenous peoples' adaptation to the rapidly changing environment.

Several important points make this study actual. Assessing mainly the spontaneous way of the Altai Mountains population adaptation to the described conditions, we also provide some examples of a successful merge of the indigenous communities interests with those of business structures, and also with legislative and administrative initiatives of the authorities at various levels. We will also report some negative processes that require urgent decisions in the sphere of regional environmental and socio-economic policy formation. The actuality of the problems under our study in terms of their social aspects has been stressed earlier in numerous studies from other regions with similar socio-economic problems. The same holds true for their environmental aspect, especially considering the importance of the Altai Mountains geo-biospheric complex not only for Russia but also for Kazakhstan, China and Mongolia. In this regard the main conceptual question consists in selecting a development scenario, which could be: (1) conservative, i.e. creating many protected areas in the region; weakness of this scenario is the conflict between the growing social and economic interests of indigenous peoples and objectives of the "closed" areas; (2) industrial (as an example, such scenario was implemented in the mountain area of a neighboring industrial region of Kuzbass, where the local Turkic Shor communities have in fact been assimilated); or (3) innovative, that, according to the authors, means combining the traditional nature management with modern achievements in technology and socio-economic development. For realization of the latter scenario the ecological culture of traditional societies has to play the key role.

This study also highlights the problem of impossibility of applying the experience of traditional nature management in the present conditions. The apparent non-competitiveness of goods and services provided by indigenous communities brings about refusal of their traditions and the choice of the usual extensive model of economic development. That leads to instability of the territory and to a rise of environmental and social problems.

Thus, besides the theoretical need for study and explication of traditional ecological culture there is also a need for a conceptual development of a new environmental management model for the mountain areas, in which the ecological culture should play an important role. The social and natural complexes of the Altai Mountain region are taken as a model.

## Methods

It is generally recognized that everything belonging to the sphere of culture has many definitions, and researchers have to choose a concrete aspect of questions under study for specification. In this research the environmental culture is first of all considered to be a wide range of phenomena (including a personal responsible attitude to nature, on what insist a large number of Russian authors), traditional ecological culture, as a system of environmental taboos, rituals, early conceptions and so on, which is studied by ethnographers and socio-cultural scientists. The authors' position consists in the following. The existing stable system of relations between man and nature in mountainous regions of northern Eurasia has developed as a result of centuries-old life experience in difficult for humans living conditions. The main feature of successful environmental management is its sustainable and non-exhausting character. We suggest to take into account modern conditions and tasks, so it is necessary to add the method of economic analysis to the already known ethnographic, socio-cultural and environmental methods.

The interdisciplinary character of the research method is not limited to the listing above. The analysis itself has a general scientific value, but the declared above problem – to contribute to the development of an effective regional policy – also requires a legal line of sight of the problem, in order to offer real mechanisms to practical implementation of ecological culture experience, and what is especially important for the authors, – to combining traditional experience with modern ecological and economic technologies.

That logically demands a financial and economic study of problematic issues, in order to show how and from what sources it is possible to attract investment to a sector that can be fairly risky for business. This methodological approach goes together with a very complex research task. For example, the communities of Altai Mountains consider some objects of this area sacred and holy. How to evaluate this developing trend not only in its cultural aspects? The scale of this phenomenon is such, that it is impossible to not take it into account. To consider it as just a socio-cultural phenomenon is not enough, to ignore the ecological and economic benefit of lending a sacred status to natural objects would be counterproductive.

The existence of UNESCO World Natural Heritage objects on the Altai Mountain territory is one of the many arguments in favor of an attentive and careful attitude to the region. An adequate socio-economic and environmental policy should realize an effective model of region conservation. Besides, preservation of the bio spherical and cultural potential of mountain areas traditional communities will allow us to speak about the enrichment of the human knowledge of nature management experience with that of the Altai peoples. It is also known that such kinds of questions concern scientists and authorities in neighboring Kazakhstan, China and Mongolia. Many sources give a convincing evidence that some other countries with mountain areas, where the traditional forms of farming still exist, face those problems, too. Trying to make a contribution to solving the above-mentioned problems, we present some results and draw conclusions, in the hope that they will be both interesting and helpful in the development of strategies for sustainable development of the Altai region.



Thus, a multidisciplinary approach based on the synthesis and analysis of the specified problems in social ecology, history, culture, ethnology, regional and environmental economics was used as the primary method of this study.

### **Data, Analysis, and Results**

The integration of communities living in mountainous regions into modern economies is contradictory to the overall current economic system.

The contradictions are associated with the problems of adaptation of the traditional way of life (including economic) to changing environmental (mostly climate, but other consequences of anthropogenic activities in the last century), as well as social and economic processes it is accompanied by. There is the need to orient economical activities of indigenous people in a situation of the current economy. It is necessary to help them understand the direction in which it is advisable to build their economic activity from the point of view of preservation of the practice of traditional nature management of the mountainous region and its integration into the overall economic system (Vinogradova & Masloboev, 2015; Hanna, Langdon & Vanclay, 2016). The most rational solution for the individual territories is (the) reference to previous experience of the economic activities organization in the regions with special status, as well as the development of the economy sectors, which could be organically fit into inter-regional economic (Levin, Kark & Crandal, 2015). In this context let us consider the problems of formation and realization of socio-economic policy in the Altai Republic - one of the mountainous regions of the Russian Federation.

### **Problem Formulation**

The Altai mountain territory has a unique status not only because it is bordering on three states – China, Mongolia and Kazakhstan. Altai is also a cultural center, where three major world religions (Buddhism, Christianity and Islam) peacefully coexist. Besides, the Altai territory is made up of unique natural and climatic zones. All the most important ecosystem types are presented here – high-mountain tundra, dark coniferous forest (chernaya taiga), semi-deserts, steppes, marshes, etc.; some territory parts are declared UNESCO World Heritage Sites. However, all these zones are situated within a relatively small area – 92.9 Kkm<sup>2</sup>, and this fact has a major impact on the formation of the regional economy: a variety of landscapes and climatic zones within a relatively small area does not allow discussions at the federal administrative level about creating a cluster or an industrial complex in the area. Low population density, poor infrastructure, insufficient labor force quality and other circumstances (mostly political at the level of the federal administration) are serious limiting factors for betting on the so-called "competitive advantages" of the territory (Engoyan & Surazakova, 2006). Thus the problem of developing an effective economic policy for regions such as the Altai Mountains arises.

The study of the previous regional economic experiences as well as the existing potential of rational and effective nature management culture of the peoples living in the Altai Mountains make us study more intently the forms, dynamics and characteristics of various spheres of economic activities promoted in mountain regions.

There are demonstrative examples for each more or less economically advanced region.

For instance, the Altai peoples especially respected the larch-tree that was associated with the activities of shamans: according to shamanistic ideas. Reduction of larch-tree areas in Altai highlands, for example in the Kosh-Agach district of the Altai Republic, has led not only to desertification, but also to enhancement of cryogenic processes. According to V.F. Radlov (1871), this area was covered with dense forest; there was swampy lowland, rich in herb, that provided forage for cattle farming. However, as a result of unsustainable economic activities and breaches of traditional nature in respect of the totem species (in this case - the uncontrolled felling of larch-trees) as early as the 1930s the climate Kosh-Agach area was characterized by low humidity. The limitations, which are dictated by traditional land management were ignored and it has led not only to distortion and degradation of ecosystems, but also to changes in the organization of economic activities in the region. It is a known fact, that today this area of the Altai Republic is characterized by an extremely harsh climate. This has a negative impact on the socio-economic processes (associated with climatic conditions costs increase) and, consequently, the competitiveness of goods and services produced in such territories is reduced. All this leads to deceleration in social and economic development of the territory, including unequal conditions in the process of improving living standards, that also leads to departure of young people, reduction in human resources and so on. Overcoming these negative effects requires complex government regulation, primarily in the formation of sustainable environmental management mechanisms in the region.

Some studies (Shishin & Makarova, 2010; Shishin, 2013) show that there are problems common to all traditional societies, examined in different countries: there are concerns about purity of water resources, reproduction of herbs and trees, etc. Beliefs also have considerable practical effects in different traditional societies. Thus, in the traditional societies of Altai and Sayans strong religious beliefs are associated with abidance by a wide range of rituals (totem trees felling is under a ban, hunting is regulated, etc.). That demonstrates interrelation of local cultural traditions and environment protection ideas. It has been shown that the areas where the local culture and beliefs are endangered (e.g. there is decline of native languages or extinction of traditional cattle breeding), are also areas with the most serious environmental problems. Destruction of the taboo or partly- taboo natural complexes in Mongolia has led to serious desertification (Beket, Shishin & Engoyan, 2015).

A similar situation is revealed in the study of environmental management practices of North American Indians. The changes introduced by human activities to the natural environment were temporary and reversible. Traditional nature management of the North America peoples assumed cyclic terms of land and water meadows usage, regulation of seizures of excessive hunting and fishing objects. This management approach of Native Americans suggested numerous prohibitions which actually forestalled overexploitation of resources. Intensification and industrialization of the territories have led to significant environmental changes, degradation of ecosystems, thereby undermining the foundations of the existence of indigenous communities. Just so should be also understood the tragedy of the High plains, which is known as the "Dust Bowl" (White, 2006).



It should be noted that the Altai landscape and natural-climatic diversity make the region on the one hand attractive for tourism and recreation businesses, and on the other hand vulnerable in relation to environmental sustainability and also to current processes in social-economic, cultural and political spheres.

The current economic activity intensification is connected with the whole complex of problems and contradictions. These contradictions often lead to various forms of complicated multi-layered conflicts. With that, the pivotal subjects of such conflicts are the legislation and the cultural specifics of communal and individual farming in the area.

This is the case with the key issue of land matters arrangement, when considering economic activities organization in relation to traditional nature management forms and potentials (Cumming et al, 2015; Hanna, Langdon & Vanclay, 2016; Novikova, 2013). There is a wide diversity in regional land matters (Hanna et al, 2014; Levin, Kark & Crandal, 2015; Maciejewski & Cumming, 2015; Vinogradova & Masloboeva, 2015). Nevertheless if we talk about the economic activities of indigenous communities, we face some common for the Russian Federation problems. The indigenous peoples and their communities in this country have the right to use on a gratis basis lands of different categories in places of their traditional residence and traditional economic activities, necessary for their traditional economic activities and engagement in traditional crafts, as well as common minerals in the order established by the federal legislation and the legislation of the Russian Federation subjects. The right is enshrined in the law on guarantees, however it remains largely declarative. According to paragraph 2 of Article 11 of the Federal Law "On traditional nature management territories of the indigenous peoples of the Russian Federation North, Siberia and Far East " plots of land and other separate natural objects that are within the boundaries of traditional territories, are provided to individuals and communities belonging to minority peoples, in accordance with the legislation of the Russian Federation (the Federal Law-49). However, according to the Land Code of the Russian Federation (2015), the indigenous peoples' individuals and communities (as well as any other subjects) can get land-plots from the state- or municipally-owned lands only by way of purchase or rent (RF LC). Such formal equalization puts them at a disadvantage, as the traditional way of life and the traditional economy, which they carry out, often make it impossible to obtain sufficient income to purchase land on an equal basis with other buyers and tenants. It would be fair to fix the gratuitous land use possibility for individual and communities' representatives of indigenous peoples in the land law (Yakel, 2014; Zhukova, 2015). This is necessary because the right to land is particularly important for indigenous peoples and their representatives, as it determines their state, legal and economic status.

If we speak about the economic activities of indigenous peoples we also face certain restrictions. According to Article 50 of the Civil Code (2015) and Article 1 of the Federal Law "On General Principles of Russian Federation North, Siberia (2015) and Far East Indigenous Peoples Communities Organization" indigenous communities are organized to protect their ancestral habitat, preserve and develop traditional lifestyle, management, crafts and culture, and are non-commercial organizations (the Civil Code, 2015). That is they have the right to



engage in gainful activity for the realization of the objectives for which they have been organized only, and if it accords with these purposes (the Civil Code, 2015).

Certainly, indigenous people's individuals have the right to create some types of organizations engaged in the traditional economy and in the trades of minorities (paragraph 6 of Part 2 of Article 8 of FL-82), and the communities can not realize such activity to get profit only. In principle, it is the general terms logic of the legislation on legal persons. However, it should be understood that on these conditions indigenous people's individuals have to create two legal entities: a non-commercial entity (community) "with the soul component" and a commercial one to get profit from their traditional trade and crafts. In addition the Federal Law "On guarantees of the Russian Federation indigenous people's rights" does not confer the right for individuals not belonging to indigenous peoples to engage in traditional economy and crafts of indigenous peoples as self-employed entrepreneurs. Certainly they have the right to do that, however, in the formal general grounds that is more burdensome for them.

This situation complicates the economic integration of indigenous people's communities and individuals in the surrounding community.

In this regard traditional economic activities including traditional environmental management, rather, as a kind of hobby, expressed in the form of continuation of previous generations rites (practices) and the experience. However, such activities can not ensure decent life to community members. Moreover it discredits the historical trade and exchange relations between the peoples and, consequently, its culture as such, isolating the people in economic terms. Thus, there is a contradiction: traditional nature exploitation maintenance deprives the community members of opportunities to provide produced by the traditional economic activities goods and services either on a voluntary basis or carrying an extra burden. Taking into account social and economic dynamics in the Altai Republic this restriction eliminates the interested in preserving of traditional nature exploitation indigenous communities integration in the overall economic system.

### ***Experience and practice of problem-solving***

It may be referred to the North America indigenous peoples experience to understand preceding, accompanying and characterizing described above phenomenon. Of course, historically the realization of the indigenous peoples rights in different countries takes place in a variety of socio-political and economic circumstances. Nevertheless, a careful analysis of similar processes in different countries may allow us to speak of some general trends.

In general terms the penetration of new management forms and ways in established and environmentally sustainable indigenous people's lifestyle is controversial (particularly about their distance from the global economic processes): some social and economic processes are slowed down, others are amplified (Røpke, 2016). However, we can identify some common factors: migration increase (mostly the outflow from the places of traditional habitat and nature exploitation), urbanization and change in rate increment in indigenous ethnic groups. Thus, on the one hand assimilation and social stratification are developing, on the other hand the basis of ethnic and political consolidation, the growth of ethnic identity are forming (Lopulenko, 1988).



A pivotal issue in conflict situations and the stimulation of deformation processes in the indigenous ethnic groups, as noted above, served earlier (and now still serves) the problems of land distribution and redistribution, as well as the regulations of nature exploitation – the ban on hunting, the mode of restrictions in land use, etc. Crucial lands of mountain areas are providing transhumance pastures and meadows, nomadic migrations and the other forms of traditional nature management. Breaking the cyclical economic process and preventing traditional and adapted to the ecosystem integrity farming methods can therefore trigger especially disastrous ecological and economic consequences in these areas.

Often such divisiveness is connected with the specifics of the traditional approach to environmental exploitation, which is practiced by the mountain peoples. Let us consider some, in our view, pivotal aspects of this specificity.

At first we note that the traditional approach cultivates responsibility and respect for the habitat and the natural environment, implies a certain system of restrictions usually fixed in world-view concepts of the peoples living in that area (Anudarieva, 2014). In addition, a fundamental principle of the traditional approach is the absence and, therefore, active censure of redundancy: it can take from nature only the number of plants, animals, natural material, which is necessary for accommodations and food. Exactly redundancy leads to the withdrawal of the nature surplus, much of which are unclaimed. That disrupts and destabilizes the environment firstly at the expense of the process and the fact of withdrawal of surplus (as the result the natural resource (forests, fisheries animals, forest products, etc.) is exhausted) and secondly at the expense of waste amount increasing and landfills proliferation, leading to increased degradation of natural ecosystems.

At the same time the principle of non-redundancy is extremely fragile and vulnerable. However, from our point of view, the fragility of the principle and/or the refusal of redundancy suggest its high anthropological and evolutionary significance, as everything what is not reduced, or just destroyed, can be considered as an attribute of high cultural organization. Under the pressure of such modern concepts as "competition", "competitive advantage", "growth of supply and demand" and other aggressive current public media cliché terms, nature conservation systems of restriction (for example, in the indigenous peoples cultures) are getting weaker, erode from global human culture and degrade.

However, now just the removal of restrictions is perceived as an adaptation: the promotion of competition leads to tendency to organize economic activity in modern nature destroying schemes that are, focusing on business approaches which withdraw from the nature an excessive amount of resources to offer the consumer market as much as possible. The result is exhaustion, depredation and degradation of natural ecosystems, destruction of the lifestyle and, as consequence living standarts and life quality reducing.

The world practice shows that all new or restored economic management approaches require fundamental world-view restructuring. This was expressed most accurately by the outstanding European thinker A. Schweitzer, who put forward the thesis of "reverence for life." The idea of human responsibility for the preservation and sustainability of nature is largely the same as traditional world-view concepts reflecting the different forms of culture and postulating the



human being and the world inextricable connection. Such are ideological constants fixed in the culture of the indigenous peoples living in the mountainous regions. Thus, not only management forms, but past world-view experience of traditional societies should not be considered as archaic now and can represent as an important element of the modern ecological culture (Shishin & Makarova, 2010).

At the same time this is the main difficulty of the adjustment process: civilizational attributes to the peoples, which have not lost their traditional approach and preserved the not-consumer culture, are a kind of "Trojan horse" which is destroying, but having the certain value forms and good. Here it should be noted that preservation and development of traditional nature exploitation considerably depends on people individuals understanding of such experiences value, their relevance to culture preservation and, consequently, the people as a whole. Leaving aside the problem of value choice in general, we denote the importance of this dilemma: preservation of culture, rational and sustainable way of life and traditional nature exploitation experience in the first place depend on the value choice, and then on financial and economic prospect.

There is no doubt that today it is difficult to talk about importance of principle of non-redundancy on the dominant paradigm background of a consumption growth pivotal role. Often such theses are accompanied by an appeal to environmental aspects. However, in our view, excessive consumption (stimulating excess production) contains serious social, economic and perhaps even political problems.

In this context the diversity and compatibility of the mountain area landscapes and cultures (in particular Altai Mountain Region) can obviously provide attractive prospects to the business projects in the sphere of tourism and recreation activities, agriculture and so on (Maciejewski & Cumming, 2015).

However, the result is the amplification of anthropogenic pressure on environment, the impoverishment of landscapes and natural complexes, as well as unification of the way of life, cultural and social aspects of the residents exposed to the impact of introduced elements in their everyday life.

At the same time, such economic activities as tourism, resort and recreation business, development of transhumance and primary processing of livestock products according to the traditional recipes and technology have the potential to overcome the conflicts in traditional land use integration into the overall economic system.

This is a science-based calculation, legislative fixation, normative and legal regulation of the territory economic capacity use (recreation business, the use of pastures and hayfields, etc.). The regulation of the territory economic potential use reduces to a common denominator the economic (commercial) activities sphere and traditional nature exploitation cultural and historical forms, based on the taboo system and restrictions regulating intrusion degree into the human environment. There was the economic system special position in the vital function ecosystems – the mountain peaks, forests, water bodies (Kypchakova, 1983). Today a mountain deification tradition is most consistently preserved in Mongolia. Every year the president of the country declares one of the peaks as sacred and makes a special kind of mountain worship rites. In recent years a number of Western Mongolia mountain ranges have acquired a similar status: they are mountain Sutai, Altyn Huhy, Tsambagarav, Otton Tenger. The latest



peak (Otton Tenger) is located on the Khangai ridge, is considered as the main sacred place of all Mongolians (Oirats and Khalkha). Thus, the system of natural objects taboo in this Central Asian country has to ensure the sustainability of natural resources in the social-economic policy formation and implementation.

At the same time it should be noted that an effective policy formation in mountainous regions should be based on the small and medium-sized businesses development. The creation of large industrial enterprises or the implementation of major industrial projects can lead to accelerated degradation of ecological and social systems. These activities would be incompatible with both the living there people's traditions and the sustainable development principles (Novikova, 2013). Keeping the planned economic activities and business projects close to traditional exploitation of natural resources principles is much more appropriated, especially in such areas as transhumance, as well as tourism and recreation.

Successful projects for the implementation of renewable energy technologies have been now implemented in the Altai Republic. For example, the Dzhazatorskaya Hydro-Power Plant (HPP) was built on the river Tyun (inflow of the river Dzhazator) and commissioned in 2007. The Dzhazatorskaya HPP, replacing diesel power, today is the only generating source created on the basis of its local grid. There are no registered so far damages to natural resources in the upper reaches of the river and its basin, the ecosystem has not changed significantly. At the same time the introduction of hydroelectric power plants in operation led to positive socio-economic changes in the municipality: the standard of living raised, increased purchasing power and solvency demand increased as well as admission to the budget. Such effects became possible due to the specific modes of operation of the energy at the object: there is a surplus of energy in summer which allows developing economic activities in an environmentally acceptable form and close to the traditional forms of wildlife locals. So, in 2012 two timber processing modules based near the Dzhazatorskoy HPP has been operated, introduction of modules for processing of milk and meat is planned (Surazakova & Epishev, 2012).

The HPP on the river Kayru (Ulagansky District Altai Republic) should be recognized as less successful experience of the construction. With all the opportunities that existed in the area of Chulyshman valley, in order to meet the challenges of autonomous power supply to the local Balykcha village, the extremely wrong watercourse was selected. This has led to serious difficulties in the operation of hydraulic structures because regular stone alluvia reduce the exploitation features of the plant. Newertheless, the HPP "Kairu" partially solves the problem of independent power supply of the village.

The innovative experience in solving the problems of energy supply of municipalities is noteworthy: construction of mini-wind farms to power Kok-Pash village (Ulagansky District) and Bele village (Ulagansky District), building a diesel-solar power plant in the village Yaylyu (Turachakskiy district), ensuring energy (solar power) to the radio relay cellular station in Biyka village (Turachakskiy district), providing electricity to shepherd sites by solar panels, building solar power plant of 5 MW in the Kosh-Agach district and others.

However, the modern approaches are required to realize assigned tasks efficiently. They combine the traditional world-view, the practice of environmentally sound (traditional) nature exploitation and modern

technologies. As an example of this approach there are some mechanisms in the Republic of Altai. It stimulates small business as well as the energy-saving technologies development and renewable energy through subsidies (up 40 percent) from the budget. Beginning with 2008 more than 360 energy complexes of various capacities have been implemented in the region in the framework of the republican program "Development of small and medium enterprises in the Altai Republic" focused on energy conservation measures. The main consumers have become private entrepreneurs engaged in traditional nature exploitation, generally in the transhumance. The total capacity of already installed solar panels and wind turbines equals to more than 250 kW. Before, implementation of these energy complexes based on new technologies, the local peoples have got the power exclusively through its generation by diesel and petrol generators.

### Discussion and Conclusion

Thus, the solution of the unique mountain regions preservation problems is possible as the consolidation of the economic activity efforts of various agencies and players - business, government and public organization. Naturally the proposed forms and directions of regional economic policy have to be studied, and approaches need to be optimized, but, today the focus on updating traditional nature exploitation, without exaggeration, plays a pivotal role not only in overcoming of contradictions between economic development and cultural and environmental determinants, and in the organization of social-economic formations at various levels survival strategy (ethnic, territorial administrative units, interregional and national economic structures, etc.). Rejection of consumer over-consumption behavior is the only way of the humanity as a whole survival.

Thus, the achievement of the tasks of preserving the unique mountain regions is only possible via combining efforts of different agencies and subjects of economic activity – those of business, government and non-governmental organizations. Modern efficient ecological culture is understood by the authors as a harmonious system of traditional sustainable nature management by indigenous peoples of mountainous areas, supported by modern technologies. Our analysis of the situation in the Altai Mountains of the Russian Federation allows us to draw a number of conclusions that can help in the regional environmental policy formation:

1. In a number of countries in North Europe and America the problems of adaptation of indigenous population of the mountain areas have long been identified and effective mechanisms for solving some of them have been already found. In this regard, there is a need for deep analysis of this experience and a search for ways of its implementation in the conditions of Russia.
2. Our review shows that the most resistant to the socio-economic, environmental and climatic challenges are those communities that have been able to achieve a harmonious synthesis of traditional nature management and modern technologies, such as use of alternative energy systems and information technologies, and that have managed to establish mutually beneficial social and economic ties with the environmental socio-economic system.
3. It is necessary to consider the creation of sacred natural sites (sacred mountains, lakes, rivers, forest groves, etc.) as valuable experience. They should be equated in status to the state natural parks at national regional and federal



levels. Even before that step, they should be included in the general system of especially protected areas, taking into consideration high communal protection of those areas.

4. It is necessary to evaluate volumes of carbon sequestration by mountain natural complexes (mountain forests, alpine bogs, etc.) according to international procedures (Gold Standard, VCS, etc.). That should be supplemented by the assessment of ecosystem services in protected areas of mountain regions (including the tourism potential). In consideration of their role in climate stabilization, water and air regeneration, the communities "natural" capital can be significant. Climate agreements (Kyoto Protocol, Paris Agreement 2015, etc.) provide practical opportunities for attracting investments from "climate funds".

5. All new investments should be directed to the development of micro- and small-enterprises (e.g, production of medicinal raw materials, apicultural products, livestock raising, etc.). In conjunction with the traditional practice of effective pastures and hayfields rotation that would lead to the formation of sustainable land use. In this regard there are great prospects in the field of biotechnology. For instance, it has been proved that Altai is a center of biological diversity of wild as well as cultivated animals and plants. There has been a considerable potential of domestic animals with strong immunity and adaptive capability preserved. That possession can introduce the community of mountain peoples to the growing market of genetic materials, if the community is provided with modern equipment. (Thus the genetic material of elite breeds of Altai red deer has been sold from the Altai Republic to New Zealand).

6. It is necessary to join the efforts of Altai macro-ecosystem countries (Russia, Mongolia, China and Kazakhstan) in the development of mechanisms, that help adapt mountain areas to the present crisis conditions in ecology and economics. In this respect some projects mentioned in this article seem promising: creation of a UNESCO "Golden Mountains of Altai" cross-border area (an extension of which could be inclusion of the neighboring unique natural complexes of the adjacent states); creation of a cross-border biosphere territory "Altai", formation of a common ecological framework of the Great Altai.

## Implications and Recommendations

Preservation of Altai is not only a regional or a Russian task. WWF has included Altai in the global list of 200 strategically important for preserving biodiversity and maintaining ecological and climatic balance areas. In this regard, the authors present an analysis and some offers on solving the problem of achieving the synthesis of traditional land use, legislation (including the level of international agreements) and modern technologies in mountain areas (Altai Mountains as the study case here), which opens debate on the problems, important at a much higher than local level.

Naturally, the proposed forms and directions of regional economic policy must be studied further on, and the approaches have to be optimized, but, we repeat, today the focus on updating traditional nature management, without exaggeration, is playing a key role not only in overcoming the contradictions between economic development and cultural and environmental determinants, but also in the creation of the survival strategy for socio-economic formations at various levels (those of nationalities, administrative-territorial formations,

interregional and national economic structures, etc.). The rejection of the currently prevailing in many countries consumer (unsustainable) behavior can be the only way of survival of the mankind as a whole.

It is therefore necessary to accentuate the need of development and implement regional, state and international policy of consumer attitude renunciation to nature and environment. Modern economic development has to be based on the implementation of non-exhaustive nature exploitation, the experience of which is kept, as among other traditional societies, in the mountain peoples' cultures.

### Disclosure statement

No potential conflict of interest was reported by the authors.

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